

## How Does Obesity in Adults Affect Spending on Health Care?

### Summary

Over the past two decades, the adult population in the United States has, on average, become much heavier. From 1987 to 2007, the fraction of adults who were overweight or obese increased from 44 percent to 63 percent; almost two-thirds of the adult population now falls into one of those categories. The share of obese adults rose particularly rapidly, more than doubling from 13 percent to 28 percent. That sharp increase in the fraction of adults who are overweight or obese poses an important public health challenge. Those adults are more likely to develop serious illnesses, including coronary heart disease, diabetes, and hypertension. As a result, that trend also affects spending on health care.

This Congressional Budget Office (CBO) issue brief examines changes over time in the distribution of adults among four categories of body weight: underweight, normal, overweight, and obese. Those categories are defined in federal guidelines using a measure known as the body-mass index—a measure that standardizes weight for height. CBO analyzes how past changes in the weight distribution have affected health care spending per adult and projects how future changes might affect spending going forward. (In this issue brief, “health care spending” refers to spending by public and private insurers and out-of-pocket spending by individuals.)

According to CBO’s analysis of survey data, health care spending per adult grew substantially in all weight categories between 1987 and 2007, but the rate of growth was much more rapid among the obese (defined as those with a body-mass index greater than or equal to 30). Spending per capita for obese adults exceeded spending for adults of normal weight by

about 8 percent in 1987 and by about 38 percent in 2007. That increasing gap in spending between the two groups probably reflects a combination of factors, including changes in the average health status of the obese population and technological advances that offer new, costly treatments for conditions that are particularly common among obese individuals.

A relatively simple set of calculations using survey data indicates that if the distribution of adults by weight between 1987 and 2007 had changed only to reflect demographic changes, such as the aging of the population, then health care spending per adult in 2007 would have been roughly 3 percent below the actual 2007 amount. Similar calculations show the potential effects of different trends in adults’ body weight on future health care spending. CBO considered three scenarios. In all three, CBO assumed that per capita health care spending will continue to grow faster for adults whose weight is in the above-normal categories than for those whose weight is considered normal. CBO’s assumptions and findings for the scenarios are as follows:

- First, CBO assumed that there will be no future changes in the distribution of adults by body weight and, therefore, that the prevalence of obesity will remain at the 2007 rate of 28 percent. If so, per capita spending on health care for adults would rise by 65 percent—from \$4,550 in 2007 to \$7,500 in 2020, CBO estimates—largely as a result of the continuation of underlying trends in health care that have led to rapidly increasing spending for all adults regardless of weight. (All dollar figures are in 2009 dollars.)

### Summary (Continued)

- Alternatively, CBO assumed a rising prevalence of obesity—namely, that recent trends (from 2001 to 2007) in adults’ body weight will continue. In that scenario, the prevalence of obesity would rise to 37 percent by 2020, and per capita spending would increase to \$7,760—about 3 percent higher than spending in the first scenario.
- CBO also assessed the impact of a possible reversal in recent trends by assuming that, by 2027, the distribution of adults’ body weight will return to the 1987 distribution (essentially reversing what happened from 1987 to 2007). In that scenario, the prevalence of obesity among adults would drop to 20 percent by 2020. Per capita spending would increase to \$7,230 in 2020—about 4 percent lower than spending in the first scenario.

Because lower rates of obesity are associated with better health and lower health care spending per capita, there is considerable interest in devising policies that would reduce the fraction of the population that is obese. Research and experimentation in this area are

ongoing, but the literature to date suggests that the challenges involved in reducing the prevalence of obesity are significant.

How reducing obesity would affect both total (rather than per capita) spending for health care and the federal budget over time is less clear. To the extent that people, on average, lived longer because fewer individuals were obese, savings from lower per capita spending would be at least partially offset by additional expenditures for health care during those added years of life. Moreover, the impact on the federal budget would include not only changes in federal spending on health care but also changes in tax revenues and in spending for retirement programs such as Social Security, for which costs are directly tied to longevity. As a result, the net impact of reductions in obesity rates on national health care expenditures and on federal budget deficits would depend on the magnitude of those various effects. This brief does not address the changes in longevity that might arise from a changing weight distribution or the potential impact of such changes on total health care expenditures.

### Changes in Adults’ Body Weight

Over the past several decades, the adult population in the United States has undergone a dramatic shift toward heavier body weight.<sup>1</sup> CBO’s analysis distinguishes four categories of weight standardized for height using the body-mass index (BMI), which equals an individual’s weight in pounds divided by height in inches squared and multiplied by 703.<sup>2</sup> Those categories are defined in federal guidelines as follows:

- **Underweight**—BMI less than 18.5;
- **Normal weight**—BMI greater than or equal to 18.5 and less than 25;
- **Overweight**—BMI greater than or equal to 25 and less than 30; and
- **Obese**—BMI greater than or equal to 30.

As used in this report, the last category includes people who are generally defined as obese but not morbidly obese (BMI greater than or equal to 30 and less than 40) and those who are morbidly obese (BMI greater than or equal to 40).<sup>3</sup> Using the above criteria, a person who is five feet eight inches tall, for example, is considered

1. The recent rise in excess weight among children is not addressed in this report but also raises important concerns. Data from the Centers for Disease Control and Prevention show that about 17 percent of children ages 6 to 19 are currently overweight or obese, roughly triple the rate observed 30 years ago. Obesity appears to persist from childhood to adulthood, so higher rates of overweight or obesity among children are likely to yield higher rates of obesity among adults in the future than would occur if childhood obesity rates were lower.
2. The metric calculation of BMI equals weight in kilograms divided by height in meters squared.

3. See National Institutes of Health, *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report*, NIH Publication No. 98-4083 (September 1998), p. xiv, [www.nhlbi.nih.gov/guidelines/obesity/ob\\_gdlns.pdf](http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf). As defined by NIH, the “obese but not morbidly obese” category includes both Class I and Class II obesity, and the “morbidly obese” category corresponds to Class III obesity.

**Table 1.****Distribution of Adults and Health Care Spending per Adult, by Body Weight, 1987 and 2007**

Weight Category	Share of Adult Population (Percent)		Spending per Adult (2009 dollars)		Percentage Change, 1987–2007	
	1987	2007	1987	2007	Share of Adult Population	Spending per Adult
	Underweight <sup>a</sup>	4	2	3,230	4,970	-50
Normal	52	35	2,440	4,030	-33	65
Overweight	31	35	2,650	4,260	13	61
Obese	13	28	2,630	5,560	115	111
Obese but not morbidly obese	12	24	2,640	5,330	100	102
Morbidly obese <sup>a</sup>	1	4	2,530	7,010	300	177
All Categories	100	100	2,560	4,550	n.a.	78

Source: Congressional Budget Office based on the 1987 National Medical Expenditure Survey and the 2007 Medical Expenditure Panel Survey.

Notes: Weight categories are defined using the body-mass index (BMI)—a measure of weight standardized for height that applies to adult men and women—as follows: underweight (BMI is less than 18.5); normal (greater than or equal to 18.5 and less than 25); overweight (greater than or equal to 25 and less than 30); obese but not morbidly obese (greater than or equal to 30 and less than 40); and morbidly obese (greater than or equal to 40).

The term “obese,” as used in this brief, combines the two categories of “obese but not morbidly obese” and “morbidly obese.”

n.a. = not applicable.

a. The estimates for the population share and spending per adult in the underweight and morbidly obese categories are based on small samples and should therefore be interpreted with caution.

underweight if he or she weighs less than 122 pounds; normal weight (between 122 and 164 pounds); overweight (between 164 and 197 pounds); obese but not morbidly obese (between 197 and 263 pounds); or morbidly obese (over 263 pounds).

BMI is not a direct measure of body fat in that it does not distinguish fat from muscle and does not identify how body fat is distributed (around the abdomen or overall)—characteristics that affect people’s health. Nonetheless, it is highly correlated with the risk of disease and death. It is also widely used by health care providers, because it is easy to collect, and by researchers, because it is available in household surveys.<sup>4</sup>

Although obesity rates began to rise around 1980 or earlier, the analysis in this issue brief focuses on the period

from 1987 to 2007 because detailed survey data are available on spending for health care over that period. CBO analyzed data on the noninstitutionalized population age 19 or older from the 1987 National Medical Expenditure Survey (NMES) and the 2001 and 2007 Medical Expenditure Panel Surveys (MEPS). Those surveys include information on individuals’ demographic characteristics, medical conditions, use of health care services, and health care expenditures.<sup>5</sup> Estimates of BMI are based on self-reported height and weight, which have been shown to be lower than estimates based on actual measurements. CBO’s findings would not be affected by such misreporting, however, if the relationship between self-reported and measured height and weight has remained roughly constant over time.

4. For a discussion of different measures of obesity, see Richard V. Burkhauser and John Cawley, “Beyond BMI: The Value of More Accurate Measures of Fatness and Obesity in Social Science Research,” *Journal of Health Economics*, vol. 27, no. 2 (March 2008), pp. 519–529.

5. Health care spending is reported as charges in the 1987 NMES but as payments in the 2007 MEPS. To make the data comparable, CBO converted charges to payments using the methods suggested in Samuel H. Zuvekas and Joel W. Cohen, “A Guide to Comparing Health Care Expenditures in the 1996 MEPS to the 1987 NMES,” *Inquiry*, vol. 39, no. 1 (Spring 2002), pp. 76–86.

The fraction of adults who were obese rose from 13 percent in 1987 to 28 percent in 2007 (see Table 1). The share of adults who were overweight increased slightly during that period, and the share whose weight was within the range that health professionals consider “normal” declined from 52 percent to 35 percent.<sup>6</sup> Another survey indicated similar changes in obesity rates during that period but measured an even higher share of the population—more than one-third—as obese in the 2003–2006 period.<sup>7</sup>

The rate of growth in the share of adults who were obese may have slowed in recent years, but different data sources provide varying indications of the extent of that slowing. In the survey data that CBO analyzed, the share of adults who were obese rose from about 13 percent to 24 percent between 1987 and 2001—the first year in which a consistent BMI measure for adults was available in the MEPS—or about 0.8 percentage points per year, on average; from 2001 to 2007, that share rose to 28 percent, for an average increase of 0.7 percentage points per year, nearly as rapid an increase as in the earlier period.<sup>8</sup> In contrast, data from the National Health and Nutrition Examination Survey (NHANES), in which BMI is calculated using measured rather than self-reported height and weight, suggest that the growth in the prevalence of obesity may be slowing much more,

especially for women. According to those data, that growth averaged 0.84 percentage points a year for men and 0.95 percentage points for women between the periods 1988–1994 and 1999–2000 but dropped to only 0.59 percentage points per year for men and 0.26 percentage points for women between the periods 1999–2000 and 2007–2008.<sup>9</sup> Both sets of data, however, indicate that the prevalence of obesity is continuing to rise. Even at the smaller growth rates indicated by the NHANES, the fraction of adults who are obese would grow by between 4 and 5 percentage points in 10 years.

Demographic changes can explain part of the overall rise in the prevalence of obesity. For example, an adult is more likely to be obese between the ages of 40 and 60 than at other ages, and the fraction of adults within that age range rose from 30 percent in 1987 to 39 percent in 2007. Even so, the data CBO analyzed indicate that demographic changes—including changes in the distribution of adults by age, sex, and race—can explain only 8 percent of the rise in the fraction of obese adults over that period. Although more research is warranted, one study found that the rise in obesity rates in the United States is related mostly to an increase in caloric intake—and, in particular, an increase in calories from snacks—rather than to a decline in physical activity.<sup>10</sup>

## Changes in Health Care Spending by Weight Category

Being overweight or obese raises an adult’s risk of developing a number of serious illnesses, and the risk is greater for obese individuals.<sup>11</sup> Those illnesses include coronary heart disease, diabetes, and hypertension. Excess weight might also increase the severity of certain diseases not

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6. Only a relatively small fraction of adults are underweight, and that share fell by roughly half from 1987 to 2007. Some patients who have severe health problems may experience unhealthy weight loss as a result of their illness or as a side effect of treatment. Thus, unlike the other changes in the weight distribution, which generally suggest unhealthy weight gains, the fall in the fraction of underweight adults might at least partly reflect an improvement in health.
  7. According to data gathered by the National Center for Health Statistics (NCHS), the share of adults who were obese increased from 23 percent in the 1988–1994 period to 34 percent in the 2003–2006 period. See NCHS, *Health, United States, 2009* (January 2010), p. 302. That survey includes measures of height and weight that are more accurate than the self-reported measures available in the data that CBO analyzed, but the NCHS survey does not collect information about spending on health care and is therefore less useful for this analysis.
  8. A recent study showed similar growth in the prevalence of obesity “Vital Signs: State-Specific Obesity Prevalence Among Adults—United States, 2009,” *Morbidity and Mortality Weekly Report*, vol. 59 (August 3, 2010). That study calculates BMI using self-reported height and weight from the Behavioral Risk Factor Surveillance System.

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9. Katherine M. Flegal and others, “Prevalence and Trends in Obesity Among US Adults, 1999–2008,” *Journal of the American Medical Association*, vol. 303, no. 3 (January 20, 2010), pp. 235–241.
  10. David M. Cutler, Edward L. Glaeser, and Jesse M. Shapiro, “Why Have Americans Become More Obese?” *Journal of Economic Perspectives*, vol. 17, no. 3 (Summer 2003), pp. 93–118.
  11. Obesity also appears to reduce longevity. A number of studies have found, however, that being overweight but not obese does not affect longevity for adults. (See, for example, Katherine M. Flegal and others, “Excess Deaths Associated with Underweight, Overweight, and Obesity,” *Journal of the American Medical Association*, vol. 293, no. 15 (April 20, 2005), pp. 1861–1867.) This issue brief does not address the relationship between excess weight and longevity.

directly caused by it. Not surprisingly, then, health care spending for adults whose weight is above normal is higher than for those whose weight is normal. That difference, which was small several decades ago, has remained relatively stable for overweight adults but has widened substantially for obese adults.<sup>12</sup>

### Health Care Spending per Adult

Health care spending per adult (in 2009 dollars) rose close to 80 percent from 1987 to 2007, from about \$2,560 to \$4,550, driven in part by the development and diffusion of new medical technology, more extensive insurance coverage, the aging of the population, and rising real (inflation-adjusted) prices for health care services. That spending grew substantially among all weight categories, but in the data that CBO analyzed, the rate of growth was much more rapid among the obese (see Figure 1). For example, from 1987 to 2007, per capita spending grew by 65 percent for normal-weight adults and by 61 percent for overweight adults, but grew much faster for obese adults—by 111 percent (see Table 1 on page 3). As a result, per capita spending for obese adults was far higher relative to spending for normal-weight adults in 2007 than it was in 1987; that difference rose from 8 percent in 1987 to 38 percent 20 years later.

### Spending per Adult on Obesity-Related Diseases

To what extent are the differences in average spending between normal-weight and obese adults attributable to obesity, and to what extent are they attributable to other factors that are correlated with, rather than a direct result of, obesity? (For example, obese adults may have other personal characteristics or habits that result in higher spending on health care.) To the extent that they are

merely correlated, attributing the differences in spending to obesity would overstate the effect of obesity on health care spending.

To examine that question, CBO identified the amount of total health care spending devoted to treating diseases that medical researchers have linked to obesity.<sup>13</sup> If the gap in per capita spending from one weight category to the next can be explained by the cost of treating those diseases, the difference in total health care spending for adults in the various weight categories is probably attributable to obesity. Alternatively, if per capita spending on obesity-related diseases explains little of the gap, factors other than body weight may account for those differences.<sup>14</sup> A similar test examines how much of the variation over time in the total spending gap from one weight category to the next can be explained by changes over time in the differences in spending on obesity-related diseases between those categories.

As one might expect, spending on the obesity-related conditions CBO identified is generally higher for heavier adults, but normal-weight adults also develop those conditions—reflecting the fact that obesity is only one of the risk factors associated with those conditions. For example, spending in 2007 on obesity-related diseases averaged \$2,030 for obese adults and \$1,090 for normal-weight adults, a difference of \$940 (see Table 2). Therefore, spending on the obesity-related diseases CBO considered accounts for about 60 percent of the \$1,530 difference in total spending on health care per capita between normal-weight and obese adults in that year. That finding leaves about 40 percent of the spending differential unexplained

12. Other studies have looked at how changes in obesity rates affect health care spending. See, for example, *The Future Costs of Obesity: National and State Estimates of the Impact of Obesity on Direct Health Care Expenses* (a collaborative report from the United Health Foundation, the American Public Health Association, and the Partnership for Prevention, updated November 2009), [www.fightchronicdisease.org/pdfs/CostofObesityReport-FINAL.pdf](http://www.fightchronicdisease.org/pdfs/CostofObesityReport-FINAL.pdf); Eric A. Finkelstein and others, “Annual Medical Spending Attributable to Obesity: Payer- and Service-Specific Estimates,” *Health Affairs*, Web Exclusive (July 27, 2009), pp. w822–w831; Darius N. Lakdawalla and others, “The Health and Cost Consequences of Obesity Among the Future Elderly,” *Health Affairs*, Web Exclusive (September 26, 2005); and Kenneth E. Thorpe and others, “The Impact of Obesity on Rising Medical Spending,” *Health Affairs*, Web Exclusive (October 20, 2004), pp. w4-480 to w4-486.

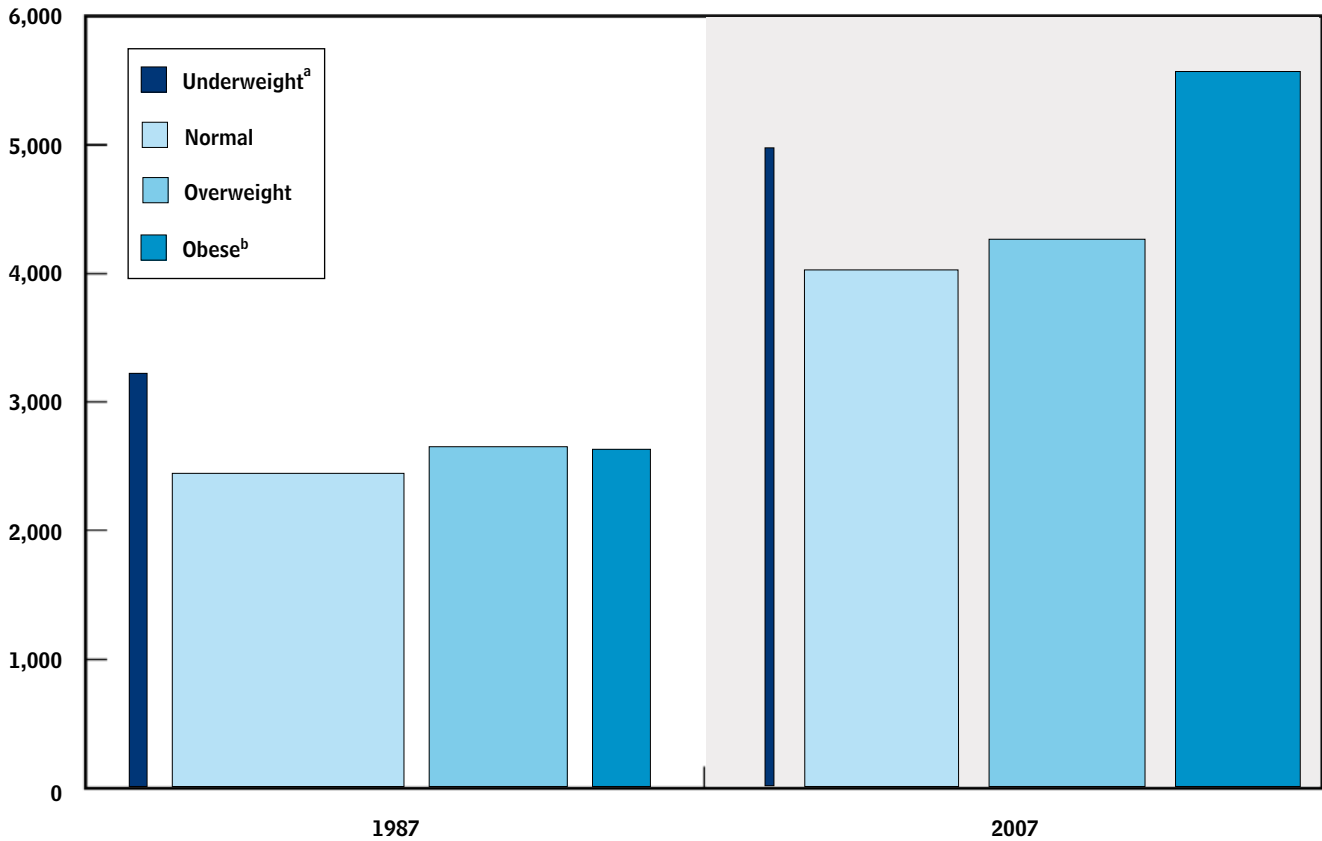
13. The obesity-related diseases examined in this analysis include coronary heart disease, type II diabetes, certain cancers, hypertension, dyslipidemia (for example, high total cholesterol), stroke, liver and gallbladder disease, osteoarthritis, certain gynecological problems, and some depressive disorders.

14. This approach is not a perfect one because there is not a clear divide between obesity-related diseases and other diseases. Instead, errors are possible in both directions. CBO’s analysis could understate the true impact of obesity because diseases other than the ones considered may also be connected to obesity in a less direct way and, hence, additional spending might be caused by excessive body weight. Working in the other direction, the survey data do not distinguish principal from secondary diagnoses and thus may encompass spending for care that is only tangentially connected to an obesity-related disease. Although those errors are hard to quantify, the first one is probably larger than the second.

**Figure 1.**

**Distribution of Adults and Health Care Spending per Adult, by Body Weight, 1987 and 2007**

(2009 dollars)



Source: Congressional Budget Office based on the 1987 National Medical Expenditure Survey and the 2007 Medical Expenditure Panel Survey.

Note: The width of each bar represents the relative share of the population in each category. Weight categories are defined using the body-mass index (BMI)—a measure of weight standardized for height that applies to adult men and women—as follows: underweight (BMI is less than 18.5); normal (greater than or equal to 18.5 and less than 25); overweight (greater than or equal to 25 and less than 30); obese but not morbidly obese (greater than or equal to 30 and less than 40); and morbidly obese (greater than or equal to 40).

- a. The estimates for the population share and spending per adult in the underweight category are based on small samples and should therefore be interpreted with caution.
- b. The term “obese,” as used in this brief, combines the two categories of “obese but not morbidly obese” and “morbidly obese.”

and perhaps attributable to factors other than body weight.

As for the growth in the gap in total health care spending per capita between normal-weight and obese adults from 1987 to 2007, about half appears to be attributable to obesity-related diseases. In particular, that gap grew from \$190 in 1987 to \$1,530 in 2008, an increase of \$1,340.

Over that same period, the gap in spending on obesity-related diseases between normal-weight and obese adults grew by \$670, accounting for about 50 percent (\$670 divided by \$1,340) of that increase. Thus, a little more than half of the difference in total health care spending between normal-weight and obese adults in 2007 and half of the growth in that difference since 1987 appears to be attributable to obesity-related diseases.

**Table 2.**  
**Changes in Total and Obesity-Related Spending on Health Care for Adults, by Body Weight, 1987 to 2007**

Weight Category	Total Spending per Adult (2009 dollars)			Spending on Obesity-Related Diseases per Adult (2009 dollars)			Spending on Obesity-Related Diseases as a Percentage of Total Spending		Obesity-Related Spending as a Percentage of Changes in Total Spending,
	1987	2007	Change, 1987–2007	1987	2007	Change, 1987–2007	1987	2007	1987–2007
	Underweight <sup>a</sup>	3,230	4,970	1,740	260	1,740	1,480	8	35
Normal	2,440	4,030	1,590	390	1,090	700	16	27	44
Overweight	2,650	4,260	1,610	540	1,390	850	20	33	53
Obese	2,630	5,560	2,930	660	2,030	1,370	25	37	47
Obese but not morbidly obese	2,640	5,330	2,690	640	1,910	1,270	24	36	47
Morbidly obese <sup>a</sup>	2,530	7,010	4,480	780	2,770	1,990	31	40	44
All Categories	2,560	4,550	1,990	470	1,470	1,000	18	32	50

**Memorandum:**  
Excess Spending for Obese  
Relative to Normal

In 2009 dollars	190	1,530	1,340	270	940	670	142	61	50
In percent	8	38	84	69	86	96	n.a.	n.a.	n.a.

Source: Congressional Budget Office based on the 1987 National Medical Expenditure Survey and the 2007 Medical Expenditure Panel Survey.

Notes: Weight categories are defined using the body-mass index (BMI)—a measure of weight standardized for height that applies to adult men and women—as follows: underweight (BMI is less than 18.5); normal (greater than or equal to 18.5 and less than 25); overweight (greater than or equal to 25 and less than 30); obese but not morbidly obese (greater than or equal to 30 and less than 40); and morbidly obese (greater than or equal to 40).

The term “obese,” as used in this brief, combines the two categories of “obese but not morbidly obese” and “morbidly obese.”

The obesity-related diseases examined in this analysis include coronary heart disease, type II diabetes, certain cancers, hypertension, dyslipidemia (for example, high total cholesterol), stroke, liver and gallbladder disease, osteoarthritis, certain gynecological problems, and some depressive disorders.

n.a. = not applicable.

a. The estimates for spending per adult in the underweight and morbidly obese categories are based on small samples and should therefore be interpreted with caution.

Those estimates suggest that a large part of the difference in total health care spending per capita between normal-weight and obese adults is a direct result of differences in body weight. When estimating changes in overall per capita spending as a result of changes in the prevalence of obesity, CBO assumed that excess weight accounts for three-quarters of the difference in spending between normal-weight and obese adults, reflecting the analysis above with an upward adjustment for the probable omission of obesity-related conditions and conditions that are made worse by excess weight.<sup>15</sup> Therefore, when an adult who would have appeared in the obese weight

category instead appears in the normal weight category, spending for that individual equals three-quarters of the spending for normal-weight adults plus one-quarter of the spending for obese adults. Conversely, when an adult who would have appeared in the normal weight category instead appears in the obese category, spending for that

15. CBO tested the sensitivity of the estimates in this brief to that assumption by computing spending under two alternative assumptions: that excess weight accounts for half or all of the difference in spending between normal-weight and obese adults. Those results were quite similar to the ones presented in this brief.

individual equals one-quarter of the spending for normal-weight adults plus three-quarters of the spending for obese adults.<sup>16</sup>

For adults in the normal weight category who would otherwise have been overweight, CBO assumed that spending for their health care would equal that for normal-weight adults. The reason is that excess body weight appears to explain all of the difference in total spending between those two weight categories. In 2007, for instance, the gap in spending between normal-weight and overweight adults (\$4,260 minus \$4,030, or \$230), shown in Table 2, can be more than fully explained by differences in obesity-related spending (\$1,390 minus \$1,090, or \$300).<sup>17</sup>

### Factors Contributing to the Growing Differences in Health Care Spending Between Normal-Weight and Obese Adults

Several factors may account for the growing gap in health care spending between normal-weight and obese adults. They include changes in the relative health of obese people and changes in treatments for obesity-related diseases.<sup>18</sup>

**Changes in Health Status.** The relatively rapid growth in spending for obese adults may reflect changes in the health status of the obese population from 1987 to 2007. Adults who are currently obese might be in poorer health than those who were obese in 1987, because advances in medical treatment in recent decades may have reduced the mortality rates for some obesity-related conditions. As a result, some obese individuals with severe health problems who would have died relatively young in past decades are probably living longer and accounting for continued spending on health care that is high even relative to spending on care for other obese adults.

16. This assumption applies to both categories of obese adults—“obese but not morbidly obese” and “morbidly obese.”

17. Analogously, when adults who would otherwise have been in the normal weight category instead appear in the overweight category, they are assigned the spending of an overweight adult.

18. Some of the measured differences in spending also may occur because of the way in which the data were collected. The 1987 and the 2007 data come from different surveys, and the way the two surveys measured health care spending was not fully consistent.

Another potential reason for the rapid growth in spending for obese adults is that adults who were obese in 2007 may have had excess weight for longer periods of time than their 1987 counterparts, as suggested by the upward trends in the likelihood that children will be overweight or obese. The adverse effects of obesity on an individual's health seem likely to accumulate over time, so obesity-related health care spending for adults who have been obese for a prolonged period is probably higher, in general, than for those who recently became obese.

### Changes in Medical Technology and Providers' Practice Patterns.

Technological change in medicine has increased health care spending per adult for all weight categories by expanding the set of available medical services, and those technological changes may have had a relatively large impact on health care spending for obese adults.<sup>19</sup> The rise in obesity's prevalence also may have promoted more aggressive use of existing technology for obese people or hastened the development of technologies that were aimed at treating obesity-related conditions.

### Effects of Past Changes in Body Weight on Health Care Spending

Determining what would have happened to health care spending if obesity rates had not increased is difficult, because it is hard to know what other aspects of the health care system might also have turned out differently—including the types of treatments developed and provided, the extent of insurance coverage purchased, and the federal payments made for health care.

A rough answer can be provided by estimating what would have happened to per capita spending if the distribution of adults by body weight had changed only to reflect demographic changes (that is, if individuals in each age, sex, and race group did not become heavier during that period) but per capita spending in a given weight category changed as observed. Under those circumstances, CBO estimates, health care spending per adult in 2007 would have been \$4,400, about 3 percent less than the amount actually observed in the data (\$4,550). That estimate is based on a calculation in which spending for the 15 percent of adults who were overweight or obese in 2007 (but who would have been

19. For examples of recently developed therapies and a discussion of technological change and health care spending, see Congressional Budget Office, *Technological Change and the Growth of Health Care Spending* (January 2008).



of normal weight if the weight distribution within demographic groups had not changed since 1987) would have been roughly 20 percent lower than if they were overweight or obese (on the basis of CBO's assumptions about the share of spending differences attributable to excess weight).

## Potential Effects of Future Changes in Body Weight on Health Care Spending

Two decades ago, health care spending was somewhat higher for obese adults than for normal-weight adults, but the differences were relatively small; a change in the fraction of adults who were obese—even a large change—would therefore have had little effect on overall spending at that time. Currently, however, differences in the weight distribution exert much more influence on spending because of the much wider gap in per capita spending between normal-weight and obese adults. Therefore, a rise in the prevalence of obesity of a given magnitude in future years would have a greater impact on average spending per adult than a rise of comparable magnitude would have had at an earlier time, particularly if the trends in per capita spending observed in the survey data between 1987 and 2007 among the respective weight categories continued.

### Projected Spending in 2020 Under Various Assumptions About Body Weight

To illustrate the potential impact of changes in body weight on future health care spending, CBO projected spending in 2020 using different assumptions about future trends in the distribution of adults and of health care spending per adult by weight category.<sup>20</sup> Specifically, CBO modeled three scenarios, all of which incorporate changes in the demographic (age, sex, and race) composition of the adult population as projected by the U.S. Census Bureau. In addition, CBO assumed that per capita health care spending will continue to grow faster for adults whose weight is in the above-normal categories than for those whose weight is considered normal.<sup>21</sup>

20. This issue brief uses the projections of health care spending described in Congressional Budget Office, *The Long-Term Budget Outlook* (June 2010, revised August 2010).

### Scenario 1: Distribution by Body Weight Remains Unchanged from 2007.

Under this scenario, individuals within each demographic category—grouped by age, sex, and race—do not become heavier over time, but body weight continues to rise slightly because of aging and other shifts among demographic categories. Under those assumptions, the share of obese adults would remain at about 28 percent in 2020, and spending per adult would rise from \$4,550 in 2007 to \$7,500 in 2020 (see Table 3)—largely as a result of the underlying trends in health care that are projected to increase spending for all adults regardless of weight (all dollar figures are in 2009 dollars).<sup>22</sup>

### Scenario 2: Distribution by Body Weight Changes at the Average Annual Rates for the 2001–2007 Period.

This scenario assumes that recent trends in adults' body weight continue. By 2020, the share of obese adults would reach 37 percent. Projected spending per capita would be \$7,760—about 3 percent higher than in the first scenario.

### Scenario 3: Distribution by Body Weight Returns to the 1987 Distribution by 2027.

This scenario represents a reversal of the sharp rise in the percentage of the adult population with above-normal weight that has occurred since 1987. That steep decline would result in 20 percent of adults being obese in 2020. Projected spending per capita would be \$7,230—that is, 4 percent lower than in Scenario 1 and about 7 percent lower than in Scenario 2. Even though obesity rates in this scenario would be lower in 2020 than in 2007, health care spending per capita would be higher, reflecting a continuing increase in underlying health care spending and in the gap in spending between normal-weight and obese adults.

## Discussion of the Results

The estimates in all three scenarios are subject to considerable uncertainty, for several reasons. One reason is that the rate of growth in spending for obese adults relative to that for normal-weight adults is uncertain. If it were

21. In 2007, spending was 38 percent higher for obese adults than for normal-weight adults. Under the assumptions used in CBO's analysis, spending in 2020 is projected to be 69 percent higher for obese adults.

22. Rounding makes the share of obesity appear unchanged. In fact, that share rises by 0.25 percentage points from 2007 to 2020.

**Table 3.****Projected Prevalence of Obesity and Health Care Spending per Adult in 2020 Under Alternative Scenarios**

	Actual 2007	Scenario 1: Distribution by Body Weight Remains Unchanged from 2007	Scenario 2: Distribution by Body Weight Changes at the Average Annual Rates for the 2001–2007 Period	Scenario 3: Distribution by Body Weight Returns to the 1987 Distribution by 2027
Percentage of Adults Who Are Obese <sup>a</sup>	28	28	37	20
Spending per Adult				
In 2009 dollars	4,550	7,500	7,760	7,230
Percentage difference relative to Scenario 1	n.a.	n.a.	3	-4
Percentage change, 2007–2020	n.a.	65	71	59

Source: Congressional Budget Office based on the 1987 National Medical Expenditure Survey and the 2001 and 2007 Medical Expenditure Panel Surveys.

Notes: Spending for 2007—the most recent year available—is based on estimates from that year’s Medical Expenditure Panel Survey.

CBO projected spending for 2020 under three scenarios, which are described in the text.

n.a. = not applicable.

a. The term “obese,” as used in this brief, combines the two categories of “obese but not morbidly obese” and “morbidly obese.”

lower than assumed, then the projected impacts of changes in the weight distribution on spending per adult over the next 10 years would be smaller than those that CBO estimated; if it were higher than assumed, those impacts would be larger.

In addition, a change in the prevalence of obesity could be reached by many paths, and those paths could have different implications for spending. For example, obesity rates could be lower if younger adults never became obese, which would reduce health care spending for that cohort. Alternatively, lower obesity rates could be achieved if adults who were already obese lost weight; but the harmful effect of obesity on health might not be fully reversible, particularly for those who have been obese for a prolonged period. As a result, the impact on spending might well be different in that case.

In all three scenarios, how changes in the distribution of adults by body weight would affect total (rather than per capita) spending for health care over multiple years is ambiguous. To the extent that the distribution changed

because fewer people were obese, and therefore people lived longer on average, savings from lower per capita spending would be offset somewhat by additional expenditures incurred during those added years of life. (The opposite would be true if there were a trend toward a higher prevalence of obesity.) The net impact of changes in the weight distribution on total health care spending would therefore depend on the magnitude of those opposing effects. Moreover, the impact on the federal budget would include not only the effects on federal spending for health care but also the effects on tax revenues and on spending for Social Security and other programs that are tied to longevity.

### Implications for Policy Initiatives

The illustrative calculations above indicate that a reduction in adults’ body weight would result in lower per capita spending on health care. However, designing public policies to reduce health care spending by preventing future cases of obesity or achieving significant and sustained weight loss among overweight and obese adults

is difficult.<sup>23</sup> In many cases, obesity is the result of poor diet and lack of exercise, both of which can be hard to change. Indeed, the evidence on the impact of various approaches to weight loss suggests that most adults who lose weight have a difficult time maintaining the weight loss without continued intervention, such as a program for improving nutrition or increasing exercise.<sup>24</sup> The costs of ongoing interventions are likely to offset at least part of any reductions in health care spending attributable to weight loss, although the improvements in health that would result might still make the interventions an appropriate use of public or private funds.

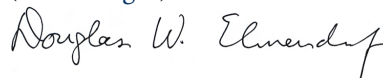
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23. See Anjali Jain, *What Works for Obesity? A Summary of the Research Behind Obesity Interventions* (paper prepared for the United Health Foundation, London, U.K., and published by BMJ Publishing Group, April 2004), [www.unitedhealthfoundation.org/obesity.pdf](http://www.unitedhealthfoundation.org/obesity.pdf); and Institute of Medicine, *Health and Behavior: The Interplay of Biological, Behavioral, and Societal Influences* (Washington, D.C.: National Academies Press, 2001). For additional discussion and sources, see Congressional Budget Office, *Key Issues in Analyzing Major Health Insurance Proposals* (December 2008), pp. 132–136.

24. See National Institutes of Health, *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*, p. 69.

Another issue concerns the relatively large increases during the past few decades in per capita spending for obese adults compared with spending for normal-weight adults. Policy initiatives aimed at reducing the prevalence of obesity would not directly affect the gap in per capita spending between the two groups, especially if that increasing gap was caused by changes in the treatment of obesity-related conditions. (Indeed, the three scenarios assume that the gap in per capita spending between the two groups continues to widen.) Therefore, another approach to reducing the spending associated with obesity would be to identify the factors responsible for that growing gap and ways to limit their influence on spending.

This brief was prepared by Noelia Duchovny and Colin Baker (formerly of CBO). It and other CBO publications are available at the agency's Web site ([www.cbo.gov](http://www.cbo.gov)).



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